

**Verification of Completion of
CREATIVE COMPONENT**

Upon completion of the Creative Component, please obtain signature from all faculty involved and submit to 401 Math Sciences to verify completion.

Student Name: _____ SID# _____

Degree Program: _____

Title and Description:

Comments: (Optional)

Project Approval:

Faculty of Record: _____ Date: _____

_____ Date: _____

Graduate Advisor: _____ Date: _____

Creative Component Assessment Questionnaire

MS Student Name: _____

Creative Component Title: _____

Date: _____

OUTCOME I : ADVANCED PROBLEM SOLVING TECHNIQUES

Characteristic	1	2	3	4	5
<i>Context</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Technique</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Method</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Rigor</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Correctness</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments:

OUTCOME II : MATHEMATICAL THINKING

Characteristic	1	2	3	4	5
<i>Abstraction</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Arrangement</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Reflections</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Theory</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments:

OUTCOME III : COMMUNICATION

Characteristic	1	2	3	4	5
<i>Content</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Organization</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Writing Style</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Oral Presentation</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Additional Comments:

**Program Assessment of MS:
Rubric for Solving Advanced Technical Problems (Outcome 1)**

Characteristics	Level of Achievement				
	1	2*	3	4**	5
Context	Demonstrates little understanding of the problem statement; shows no awareness of assumptions used; no intuition for solution is indicated.	Demonstrates some understanding of the problem statement; shows awareness of assumptions used; intuition for solution is sometimes indicated.		Demonstrates clear understanding of the problem statement; states clearly the assumptions used; intuition for solution is indicated.	
Technique	Fails to use appropriate problem-solving techniques; uses only rote approaches.	Sometimes uses appropriate problem-solving techniques; occasionally demonstrates ingenuity in solving problem.		Consistently uses appropriate problem-solving techniques; demonstrates ingenuity in solving problem.	
Method	Use of mathematical background is inconsistent and inappropriate; gives sense that all argumentation is ad hoc; exhibits no understanding of relevant background.	Usually draws upon appropriate mathematical background; ad hoc arguments dominate; demonstrates some understanding of relevant background.		Draws upon appropriate mathematical background; use of ad hoc arguments not predominant; demonstrates understanding of relevant background.	
Rigor	Argumentation lacks rigor; gives only heuristic arguments.	Argumentation is somewhat rigorous, but relies on heuristic arguments.		Argumentation is rigorous; avoids merely heuristic arguments.	
Correctness	Conclusion of argument is missing; steps to reach conclusion are lacking, or the logical flow is garbled; fails to accomplish the goal of solving the problem.	Conclusion of argument is present but not completely clear; steps to reach conclusion are present, but the logical flow is unclear; accomplishes the goal of solving the problem for the most part.		Conclusion of argument is clearly indicated; steps to reach conclusion are clearly set out, with the logical flow indicated; completely accomplishes the goal of solving the problem.	

* Exhibits most characteristics of '1' and some of '3'.

** Exhibits most characteristics of '3' and some of '5'.

**Program Assessment of MS:
Rubric for Demonstrating a High Level of Mathematical Thinking (Outcome 2)**

		Level of Achievement				
Characteristics	1	2*	3	4**	5	
Abstraction	Involves low level of abstraction; does not include general arguments; does not use definitions for concepts that recur.		Involves some level of abstraction; includes some general arguments, but may include isolated elementary results; sometimes makes appropriate use of definitions for concepts that recur.		Involves a level of abstraction appropriate to the context; includes general arguments, not just a string of isolated special cases or elementary results; makes appropriate use of definitions for concepts that recur.	
Arrangement	Overall argument is arranged in an illogical order; major concepts appear unrelated to one another.		Overall argument is arranged in a fairly logical order; major concepts are sometimes related to one another.		Overall argument is arranged in a logical order; major concepts are related to one another.	
Reflection	Does not include relevant explanations, examples, and applications; does not give alternative descriptions and does not show intuition; does not demonstrate an eye for aesthetics nor for efficiency.		Includes some relevant explanations, examples, and applications; gives some alternative descriptions and shows some intuition; somewhat demonstrates an eye for aesthetics and efficiency.		Includes relevant explanations, examples, and applications; gives alternative descriptions and shows intuition; demonstrates an eye for both aesthetics and efficiency, including an indication of why one line of argument is preferable to others.	
Theory	Does not use existing mathematical theory; does not show understanding of mathematical context.		Sometimes uses existing mathematical theory; sometimes shows understanding of mathematical context.		Uses existing mathematical theory, including concepts and theorems; shows understanding of mathematical context.	

* Exhibits most characteristics of '1' and some of '3'.

** Exhibits most characteristics of '3' and some of '5'.

**Program Assessment of MS:
Rubric for Written and Oral Communication (Outcome 3)**

Level of Achievement

Skill	1	2*	3	4**	5
Written: content	Goal of paper is unclear; does not show evidence of clear understanding of the goal nor of clear thinking; arguments are incorrect or are not mathematically rigorous; formal statements such as theorems are not clearly stated or are incorrect; does not include appropriate examples and applications; is not written at an appropriate level; shows little to no understanding of which arguments should be included; does not accomplish stated goal.	Goal of paper is somewhat clear; shows some evidence of clear understanding of the goal and of clear thinking; arguments are usually correct and mathematically rigorous; formal statements such as theorems are usually stated clearly and correctly; includes some examples and applications; written at a somewhat appropriate level; shows some understanding of which arguments should be included; mostly accomplishes goal.		Goal of paper is clearly stated; shows evidence of clear understanding of the goal and of clear thinking; arguments are correct and mathematically rigorous; formal statements such as theorems are stated clearly and correctly; includes examples and applications as appropriate; written at appropriate level for intended audience; shows understanding of which arguments should be included and which can be omitted; completely accomplishes stated goal.	
Written: organization	Includes no prefatory material; assumptions, background, and notation are unclear; flow of argument is unclear; is not structured by units; formal statements such as theorems are not accompanied by explanatory comments; no appropriate conclusion is given.	Includes some prefatory material; assumptions, background, and notation are sometimes clear; flow of argument is somewhat clear; structured by units, usually sections; formal statements such as theorems are sometimes accompanied by explanatory comments; something of an appropriate conclusion is given.		Includes table of contents, an abstract, and an introduction, as appropriate; assumptions, background, and notation are stated clearly; flow of argument is clear; organized by well-structured units, usually sections; formal statements such as theorems are accompanied by explanatory comments and are put in context; appropriate conclusion is given.	
Written: style and mechanics	Does not use standard style; does not follow standard rules for grammar, spelling, and punctuation; does not use standard mathematical notation; components such as theorems are not clearly labeled; mathematical calculations are not set off visually; citations are not given for standard results used; documentation is unclear; sources used are inappropriate; shows little or no evidence of proofreading.	Style is somewhat standard; standard rules for grammar, spelling, and punctuation are usually followed; components such as theorems are usually labeled clearly; mathematical calculations are sometimes set off visually; citations are sometimes given for standard results used; documentation is somewhat clear; sources used are usually appropriate; shows some evidence of proofreading.		Standard style for mathematical papers is used; standard rules for grammar, spelling, and punctuation are followed; standard mathematical notation is used; components such as theorems are clearly labeled; mathematical calculations are set off visually; citations are given for standard results used; documentation is clear; sources used are appropriate; shows evidence of proofreading.	
Oral	Many verbal mistakes are made; does not use correct grammar; language is not understandable mathematically; visual aids are unclear or inappropriate; speaker demonstrates little or no understanding of the problem; presentation does not have a goal and cannot be easily followed; speaker is unable to answer questions satisfactorily; speaker does not maintain focus.	Some verbal mistakes are made; usually uses correct grammar; language is usually understandable mathematically; visual aids when used, are usually clear and appropriate; speaker somewhat demonstrates understanding of the problem; presentation seems to have a goal and can generally be followed; speaker is generally able to answer questions satisfactorily; speaker maintains focus for the most part.		Verbal mistakes are limited; uses correct grammar; language is mathematically understandable; visual aids, when used, are clear and appropriate; speaker demonstrates understanding of the problem; presentation has a goal and can be easily followed; speaker is able to answer questions satisfactorily; speaker maintains focus.	

* Exhibits most characteristics of '1' and some of '3'.

** Exhibits most characteristics of '3' and some of '5'.